Date: Wed, 29 Sep 93 04:30:26 PDT
From: Ham-Space Mailing List and Newsgroup <ham-space@ucsd.edu>
Errors-To: Ham-Space-Errors@UCSD.Edu
Reply-To: Ham-Space@UCSD.Edu
Precedence: Bulk
Subject: Ham-Space Digest V93 #41
To: Ham-Space

Ham-Space Digest Wed, 29 Sep 93 Volume 93 : Issue 41

Today's Topics:

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

Date: 24 Sep 93 16:47:30 GMT
From: dog.ee.lbl.gov!agate!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!
unixg.ubc.ca!nntp.cs.ubc.ca!alberta!adec23!usenet@network.ucsd.edu
Subject: ORBS$258.2liners
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-268.N
2Line Orbital Elements 268.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM N3FKV HEWITT, TX September 25, 1993
BID: $ORBS-268.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83 58 B 93261.37176135 -.00000099 00000-0 99999-4 0   354
2 14129 27.1985   5.5050 6025636 115.1006 317.3712 2.05882714 77182
UO-11
1 14781U 84 21 B 93266.58557116 .00000157 00000-0 30660-4 0 4403
2 14781 97.8054 288.6093 0013031 44.3925 315.8324 14.69056049511161
RS-10/11
1 18129U 87 54 A 93265.78298818 .00000088 00000-0 89554-4 0 6506
2 18129 82.9282 166.4889 0013289 49.2382 310.9897 13.72323480313239
AO-13
1 19216U 88 51 B 93263.37003204 .00000121 00000-0 46210-3 0 6439
2 19216 57.8512 293.7059 7210437 324.5886   4.2495 2.09718161 40355
FO-20
1 20480U 90 13 C 93262.12161713 -.00000010 00000-0 65198-5 0 4565
2 20480 99.0281 100.4732 0540198 233.7673 121.2342 12.83221116169367
AO-21
1 21087U 91 6 A 93266.75660614 .00000084 00000-0 82656-4 0 8559
2 21087 82.9460 339.8817 0036869 106.0838 254.4375 13.74525023132981
RS-12/13
1 21089U 91 7 A 93265.77234864 .00000016 00000-0 11037-4 0 4249
2 21089 82.9210 209.7390 0029281 130.1855 230.1875 13.74026602131922
ARSENE
1 22654U 93 31 B 93241.80475365 -.00000049 00000-0 99999-4 0   211
2 22654   1.3018 119.8566 2933615 152.1382 232.4293 1.42202460 1626
UO-14
1 20437U 90 5 B 93265.76629184 .00000042 00000-0 24146-4 0 7735
2 20437 98.6094 348.9428 0010156 256.6456 103.3594 14.29792387191377
AO-16
1 20439U 90 5 D 93266.18221471 .00000034 00000-0 20940-4 0 5783
2 20439 98.6174 350.3244 0010459 256.7891 103.2140 14.29850520191449
DO-17
1 20440U 90 5 E 93266.23231091 .00000039 00000-0 22905-4 0 5801
2 20440 98.6178 350.6125 0010553 255.7561 104.2451 14.29987128191467
WO-18
1 20441U 90 5 F 93266.20321397 .00000034 00000-0 20980-4 0 5826
2 20441 98.6176 350.6033 0011285 257.3247 102.6691 14.29965946191468
LO-19
1 20442U 90 5 G 93266.75863415 .00000041 00000-0 23670-4 0 5792
2 20442 98.6182 351.3494 0011457 254.5061 105.4856 14.30057190191558
UO-22
1 21575U 91 50 B 93265.11055625 .00000053 00000-0 24709-4 0 2778
2 21575 98.4659 339.6293 0008256 16.3205 343.8248 14.36851117114584
KO-23
1 22077U 92 52 B 93263.67655469 .00000000 00000-0 99999-4 0 1156
2 22077 66.0792 124.2611 0001255 353.3278   6.7724 12.86279630 52121
NOAA-9
1 15427U 84123 A 93267.03377154 .00000085 00000-0 55517-4 0 4641
2 15427 99.0906 308.8762 0014261 250.2565 109.7076 14.13547200452746

```
NOAA-10
1 16969U 86 73  A 93267.01531806  .00000035  00000-0  23276-4 0  3071
2 16969  98.5164 279.0966 0014086  29.6511 330.5470 14.24832292364707
NOAA-11
1 19531U 88 89  A 93266.81506369  .00000144  00000-0  87997-4 0  2172
2 19531  99.1431 244.6172 0011659 157.7475 202.4215 14.12917911257604
MET-3/3
1 20305U 89 86  A 93266.57019314  .00000043  00000-0  99999-4 0  7373
2 20305  82.5486  95.4701 0014877 232.6549 127.3218 13.16023368188047
FY-1/2
1 20788U 90 81  A 93266.93605468  .00000118  00000-0  89643-4 0  6317
2 20788  98.8542 290.3499 0016188  37.5863 322.6431 14.01296183156418
MET-2/20
1 20826U 90 86  A 93266.38605979  .00000030  00000-0  21942-4 0  5849
2 20826  82.5250 358.2521 0014777  74.1263 286.1527 13.83557857150860
MET-3/4
1 21232U 91 30  A 93266.32926582  .00000043  00000-0  99999-4 0  4043
2 21232  82.5455 358.2589 0013970 127.8840 232.3548 13.16455849116248
NOAA-12
1 21263U 91 32  A 93266.65576590  .00000132  00000-0  68104-4 0  6725
2 21263  98.6502 294.9367 0012332 292.0905  67.8960 14.22312492122645
MET-3/5
1 21655U 91 56  A 93265.30307878  .00000043  00000-0  99999-4 0  4600
2 21655  82.5525 305.9270 0013492 140.9697 219.2402 13.16823738101205
MET-2/21
1 22782U 93 55  A 93265.46522455  .00000015  00000-0  83089-5 0   159
2 22782  82.5455  58.5871 0020982 256.6669 103.2151 13.82985519  3082
MIR
1 16609U 86 17  A 93266.82873996  .00007872  00000-0  99031-4 0  3121
2 16609  51.6187  83.8687 0004427 121.5263 238.6130 15.59836341434525
HUBBLE
1 20580U 90 37  B 93266.83838231  .00000637  00000-0  52868-4 0  1852
2 20580  28.4696 148.4226 0004359   3.4825 356.5832 14.92836713186272
GRO
1 21225U 91 27  B 93264.43702394  .00025569  00000-0  14973-3 0  9957
2 21225  28.4646 313.6871 0006116 328.7533  31.2722 15.76703769 15305
UARS
1 21701U 91 63  B 93265.74981556  .00003040  00000-0  28906-3 0  2561
2 21701  56.9838 150.5436 0004504  78.1255 282.0293 14.96107390110904
/EX

------------------------------

Date: 24 Sep 93 16:45:47 GMT
From: dog.ee.lbl.gov!agate!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!
unixg.ubc.ca!nntp.cs.ubc.ca!alberta!adec23!usenet@network.ucsd.edu
Subject: ORBS$268.AMSAT
To: ham-space@ucsd.edu
```

SB KEPS @ AMSAT $ORBS-268.O
Orbital Elements 268.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM N3FKV HEWITT, TX   September 25, 1993
BID: $ORBS-268.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 93261.37176135
Element set: 35
Inclination: 27.1985 deg
RA of node: 5.5050 deg
Eccentricity: 0.6025636
Arg of perigee: 115.1006 deg
Mean anomaly: 317.3712 deg
Mean motion: 2.05882714 rev/day
Decay rate: -9.9e-07 rev/day^2
Epoch rev: 7718
Checksum: 283

Satellite: UO-11
Catalog number: 14781
Epoch time: 93266.58557116
Element set: 440
Inclination: 97.8054 deg
RA of node: 288.6093 deg
Eccentricity: 0.0013031
Arg of perigee: 44.3925 deg
Mean anomaly: 315.8324 deg
Mean motion: 14.69056049 rev/day
Decay rate: 1.57e-06 rev/day^2
Epoch rev: 51116
Checksum: 306

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 93265.78298818
Element set: 650
Inclination: 82.9282 deg
RA of node: 166.4889 deg
Eccentricity: 0.0013289
Arg of perigee: 49.2382 deg
Mean anomaly: 310.9897 deg
Mean motion: 13.72323480 rev/day
Decay rate: 8.8e-07 rev/day^2

```
Epoch rev:           31323
Checksum:              344

Satellite: AO-13
Catalog number: 19216
Epoch time:      93263.37003204
Element set:     643
Inclination:       57.8512 deg
RA of node:       293.7059 deg
Eccentricity:    0.7210437
Arg of perigee:   324.5886 deg
Mean anomaly:       4.2495 deg
Mean motion:    2.09718161 rev/day
Decay rate:       1.21e-06 rev/day^2
Epoch rev:            4035
Checksum:              286

Satellite: FO-20
Catalog number: 20480
Epoch time:      93262.12161713
Element set:     456
Inclination:       99.0281 deg
RA of node:       100.4732 deg
Eccentricity:    0.0540198
Arg of perigee:   233.7673 deg
Mean anomaly:     121.2342 deg
Mean motion:   12.83221116 rev/day
Decay rate:       -1.0e-07 rev/day^2
Epoch rev:           16936
Checksum:              259

Satellite: AO-21
Catalog number: 21087
Epoch time:      93266.75660614
Element set:     855
Inclination:       82.9460 deg
RA of node:       339.8817 deg
Eccentricity:    0.0036869
Arg of perigee:   106.0838 deg
Mean anomaly:     254.4375 deg
Mean motion:   13.74525023 rev/day
Decay rate:        8.4e-07 rev/day^2
Epoch rev:           13298
Checksum:              334

Satellite: RS-12/13
Catalog number: 21089
Epoch time:      93265.77234864
```

```
Element set:     424
Inclination:       82.9210 deg
RA of node:       209.7390 deg
Eccentricity:    0.0029281
Arg of perigee:   130.1855 deg
Mean anomaly:     230.1875 deg
Mean motion:   13.74026602 rev/day
Decay rate:        1.6e-07 rev/day^2
Epoch rev:           13192
Checksum:              291

Satellite: ARSENE
Catalog number: 22654
Epoch time:      93241.80475365
Element set:      21
Inclination:        1.3018 deg
RA of node:       119.8566 deg
Eccentricity:    0.2933615
Arg of perigee:   152.1382 deg
Mean anomaly:     232.4293 deg
Mean motion:    1.42202460 rev/day
Decay rate:       -4.9e-07 rev/day^2
Epoch rev:             162
Checksum:              258

/EX
SB KEPS @ AMSAT  $ORBS-268.D
Orbital Elements  268.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM N3FKV  HEWITT, TX   September 25, 1993
BID: $ORBS-268.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time:      93265.76629184
Element set:     773
Inclination:       98.6094 deg
RA of node:       348.9428 deg
Eccentricity:    0.0010156
Arg of perigee:   256.6456 deg
Mean anomaly:     103.3594 deg
Mean motion:   14.29792387 rev/day
Decay rate:        4.2e-07 rev/day^2
Epoch rev:           19137
Checksum:              342
```

Satellite: AO-16
Catalog number: 20439
Epoch time: 93266.18221471
Element set: 578
Inclination: 98.6174 deg
RA of node: 350.3244 deg
Eccentricity: 0.0010459
Arg of perigee: 256.7891 deg
Mean anomaly: 103.2140 deg
Mean motion: 14.29850520 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 19144
Checksum: 294

Satellite: DO-17
Catalog number: 20440
Epoch time: 93266.23231091
Element set: 580
Inclination: 98.6178 deg
RA of node: 350.6125 deg
Eccentricity: 0.0010553
Arg of perigee: 255.7561 deg
Mean anomaly: 104.2451 deg
Mean motion: 14.29987128 rev/day
Decay rate: 3.9e-07 rev/day^2
Epoch rev: 19146
Checksum: 296

Satellite: WO-18
Catalog number: 20441
Epoch time: 93266.20321397
Element set: 582
Inclination: 98.6176 deg
RA of node: 350.6033 deg
Eccentricity: 0.0011285
Arg of perigee: 257.3247 deg
Mean anomaly: 102.6691 deg
Mean motion: 14.29965946 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 19146
Checksum: 311

Satellite: LO-19
Catalog number: 20442
Epoch time: 93266.75863415
Element set: 579
Inclination: 98.6182 deg
RA of node: 351.3494 deg

```
Eccentricity:    0.0011457
Arg of perigee:   254.5061 deg
Mean anomaly:     105.4856 deg
Mean motion:   14.30057190 rev/day
Decay rate:        4.1e-07 rev/day^2
Epoch rev:           19155
Checksum:              308

Satellite: UO-22
Catalog number: 21575
Epoch time:      93265.11055625
Element set:     277
Inclination:       98.4659 deg
RA of node:       339.6293 deg
Eccentricity:    0.0008256
Arg of perigee:    16.3205 deg
Mean anomaly:     343.8248 deg
Mean motion:   14.36851117 rev/day
Decay rate:        5.3e-07 rev/day^2
Epoch rev:           11458
Checksum:              311

Satellite: KO-23
Catalog number: 22077
Epoch time:      93263.67655469
Element set:     115
Inclination:       66.0792 deg
RA of node:       124.2611 deg
Eccentricity:    0.0001255
Arg of perigee:   353.3278 deg
Mean anomaly:       6.7724 deg
Mean motion:   12.86279630 rev/day
Decay rate:      .00000000 rev/day^2
Epoch rev:            5212
Checksum:              275

/EX
SB KEPS @ AMSAT  $ORBS-268.W
Orbital Elements  268.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM N3FKV  HEWITT, TX   September 25, 1993
BID: $ORBS-268.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time:      93267.03377154
```

```
Element set:     464
Inclination:       99.0906 deg
RA of node:       308.8762 deg
Eccentricity:    0.0014261
Arg of perigee:   250.2565 deg
Mean anomaly:     109.7076 deg
Mean motion:   14.13547200 rev/day
Decay rate:        8.5e-07 rev/day^2
Epoch rev:           45274
Checksum:              308

Satellite: NOAA-10
Catalog number: 16969
Epoch time:      93267.01531806
Element set:     307
Inclination:       98.5164 deg
RA of node:       279.0966 deg
Eccentricity:    0.0014086
Arg of perigee:    29.6511 deg
Mean anomaly:     330.5470 deg
Mean motion:   14.24832292 rev/day
Decay rate:        3.5e-07 rev/day^2
Epoch rev:           36470
Checksum:              306

Satellite: NOAA-11
Catalog number: 19531
Epoch time:      93266.81506369
Element set:     217
Inclination:       99.1431 deg
RA of node:       244.6172 deg
Eccentricity:    0.0011659
Arg of perigee:   157.7475 deg
Mean anomaly:     202.4215 deg
Mean motion:   14.12917911 rev/day
Decay rate:       1.44e-06 rev/day^2
Epoch rev:           25760
Checksum:              297

Satellite: MET-3/3
Catalog number: 20305
Epoch time:      93266.57019314
Element set:     737
Inclination:       82.5486 deg
RA of node:        95.4701 deg
Eccentricity:    0.0014877
Arg of perigee:   232.6549 deg
Mean anomaly:     127.3218 deg
```

```
Mean motion:   13.16023368 rev/day
Decay rate:        4.3e-07 rev/day^2
Epoch rev:           18804
Checksum:              302

Satellite: FY-1/2
Catalog number: 20788
Epoch time:      93266.93605468
Element set:     631
Inclination:       98.8542 deg
RA of node:       290.3499 deg
Eccentricity:    0.0016188
Arg of perigee:    37.5863 deg
Mean anomaly:     322.6431 deg
Mean motion:   14.01296183 rev/day
Decay rate:       1.18e-06 rev/day^2
Epoch rev:           15641
Checksum:              326

Satellite: MET-2/20
Catalog number: 20826
Epoch time:      93266.38605979
Element set:     584
Inclination:       82.5250 deg
RA of node:       358.2521 deg
Eccentricity:    0.0014777
Arg of perigee:    74.1263 deg
Mean anomaly:     286.1527 deg
Mean motion:   13.83557857 rev/day
Decay rate:        3.0e-07 rev/day^2
Epoch rev:           15086
Checksum:              326

Satellite: MET-3/4
Catalog number: 21232
Epoch time:      93266.32926582
Element set:     404
Inclination:       82.5455 deg
RA of node:       358.2589 deg
Eccentricity:    0.0013970
Arg of perigee:   127.8840 deg
Mean anomaly:     232.3548 deg
Mean motion:   13.16455849 rev/day
Decay rate:        4.3e-07 rev/day^2
Epoch rev:           11624
Checksum:              312

Satellite: NOAA-12
```

```
Catalog number: 21263
Epoch time:      93266.65576590
Element set:     672
Inclination:       98.6502 deg
RA of node:       294.9367 deg
Eccentricity:    0.0012332
Arg of perigee:   292.0905 deg
Mean anomaly:      67.8960 deg
Mean motion:   14.22312492 rev/day
Decay rate:       1.32e-06 rev/day^2
Epoch rev:           12264
Checksum:              306

Satellite: MET-3/5
Catalog number: 21655
Epoch time:      93265.30307878
Element set:     460
Inclination:       82.5525 deg
RA of node:       305.9270 deg
Eccentricity:    0.0013492
Arg of perigee:   140.9697 deg
Mean anomaly:     219.2402 deg
Mean motion:   13.16823738 rev/day
Decay rate:        4.3e-07 rev/day^2
Epoch rev:           10120
Checksum:              290

Satellite: MET-2/21
Catalog number: 22782
Epoch time:      93265.46522455
Element set:      15
Inclination:       82.5455 deg
RA of node:        58.5871 deg
Eccentricity:    0.0020982
Arg of perigee:   256.6669 deg
Mean anomaly:     103.2151 deg
Mean motion:   13.82985519 rev/day
Decay rate:        1.5e-07 rev/day^2
Epoch rev:             308
Checksum:              306

/EX
SB KEPS @ AMSAT  $ORBS-268.M
Orbital Elements  268.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM N3FKV  HEWITT, TX   September 25, 1993
BID: $ORBS-268.M
```

TO ALL RADIO AMATEURS BT

Satellite: MIR
Catalog number: 16609
Epoch time: 93266.82873996
Element set: 312
Inclination: 51.6187 deg
RA of node: 83.8687 deg
Eccentricity: 0.0004427
Arg of perigee: 121.5263 deg
Mean anomaly: 238.6130 deg
Mean motion: 15.59836341 rev/day
Decay rate: 7.872e-05 rev/day^2
Epoch rev: 43452
Checksum: 329

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 93266.83838231
Element set: 185
Inclination: 28.4696 deg
RA of node: 148.4226 deg
Eccentricity: 0.0004359
Arg of perigee: 3.4825 deg
Mean anomaly: 356.5832 deg
Mean motion: 14.92836713 rev/day
Decay rate: 6.37e-06 rev/day^2
Epoch rev: 18627
Checksum: 321

Satellite: GRO
Catalog number: 21225
Epoch time: 93264.43702394
Element set: 995
Inclination: 28.4646 deg
RA of node: 313.6871 deg
Eccentricity: 0.0006116
Arg of perigee: 328.7533 deg
Mean anomaly: 31.2722 deg
Mean motion: 15.76703769 rev/day
Decay rate: 2.5569e-04 rev/day^2
Epoch rev: 1530
Checksum: 306

Satellite: UARS
Catalog number: 21701
Epoch time: 93265.74981556
Element set: 256

```
Inclination:       56.9838 deg
RA of node:       150.5436 deg
Eccentricity:    0.0004504
Arg of perigee:    78.1255 deg
Mean anomaly:     282.0293 deg
Mean motion:   14.96107390 rev/day
Decay rate:      3.040e-05 rev/day^2
Epoch rev:           11090
Checksum:              290

/EX

------------------------------

End of Ham-Space Digest V93 #41
******************************
```